

REMARKS

Claims 1, 8, 11, 15, 16, 20, 22 and 23 have been amended. Claims 1-23, as amended remain in the application.

In the Office Action dated May 23, 2003, Paper No. 5, the Examiner identified the declaration as being defective. Enclosed is a substitute Combined Declaration and Power of Attorney for Patent Application having the original signature of the inventor.

The Examiner objected to the drawings as failing to comply with 37 CFR 1.84(p)(5) because they do not include the reference sign 10 in Fig. 1 as mentioned in the description. Attached is a proposed drawing correction marked in red for approval by the Examiner.

No new matter is added by the amendments to the drawings and the claims.

The Examiner objected to Claim 22 because the phrase "A comprising" at the beginning of the claim is not needed. Applicant amended Claim 22 to correct that typographical error and amended Claim 20 to correct a typographical error.

The present invention relates generally to water purification systems and, in particular, to a dual operation point of use water purification apparatus utilizing a three-step purification process together with a piping bypass. It is an object of the present invention to provide an apparatus to eliminate taste, odor, and health-related effects associated with the free chlorine residual provided from a municipal water supply for human drinking use. The bypass permits periodic cleansing of a point of use water distribution system connected to an inlet from a water supply. The system uses three types of filters that are commonly available such that the system is economical to use and easy to maintain.

The importance of safe municipal drinking water supplies is extensively analyzed in a recent report by the Natural Resources Defense Council as summarized in the attached copy of a press release (2 pages) and a related press conference held on June 11, 2003 in Washington, D.C. Additional information is available at the NRDC web site.

In order to ensure an effective level of chlorine at the point of use farthest from the source of drinking water, the chlorine level at points of use closer to the source will be higher than desirable. The impact of the free residual chlorine is disadvantageous and significant. The free chlorine residual alters the odor and taste of water as well as bleaches any colored organic objects including skin and hair. In addition, chlorine is itself suspected to be a carcinogen as well as a key component in the formation of trihalomethanes, which are also carcinogenic. The system according to the present invention permits dual operation to retain the cleansing advantages of free chlorine while providing safe drinking water.

The Examiner rejected Claim 22 under 35 U.S.C. § 102(b) as being anticipated by the U.S. Patent No. 5,024,766 issued to Mahmud. The Examiner stated that the Mahmud patent describes a water purification apparatus comprising a first water purification means (activated carbon bed 23), a second water purification means (filter 24), and a third water purification means (ozone, UV, H₂, O₂ reactor 25). According to the Examiner, each water purification means has an inlet and an outlet, with the outlet of the first means connected to the inlet of the second means and the outlet of the second means connected to the inlet of the third, the inlet of the first means connected to a supply of water (pump 22), and the outlet of the third means connected to a point of use (deozonation unit 26) as shown in Figure 1 and described in Column 2, lines 20-28.

The Examiner rejected Claim 22 under 35 U.S.C. § 103(a) as being unpatentable over the U.S. Patent No. 3,276,458 issued to Iversen et al. in view of the U.S. Patent No. 4,808,287 issued to Hark. The Examiner stated that the Iversen et al. patent discloses a water purification apparatus comprising a first water purification means (activated carbon bed 76), a second water purification means (retaining plug 62 housing glass wool filter 69), and a third water purification means (sterilizer 18). According to the Examiner, the first water purification means has an inlet, the second water purification means has an outlet, the water third purification means has an inlet and an outlet, with the outlet of the second means connected to the inlet of the third and the inlet of the first means is connected to a supply of water (filter 14), and the outlet of the third means is connected to a point of use (column 20, see Figures 1 and 3, column 6 lines 2-15, and column 7 lines 22-75).

The Examiner admitted that the Iversen et al. patent does not disclose a structurally distinct outlet of the first water purification means (activated carbon bed 76) connected to a structurally distinct inlet of the second water purification means (retaining plug 62 housing glass wool filter 69). The Examiner stated that the Hark patent shows a first water purification means (active carbon guard filter 3) having a structurally distinct outlet connected to a structurally distinct inlet of a second water purification means (guard filter 4).

Applicant amended Claims 22 and 23 to define a bypass means for permitting selective flow of water from the supply of water to the point of use to chlorinate water distribution pipes connected to the point of use. Neither the Iversen et al. patent or the Hark patent show or suggest the claimed apparatus with the bypass means.

The Examiner rejected Claims 1, 2, 4, 6, 11, 20, and 23 under 35 U.S.C. § 103(a) as being unpatentable over the Mahmud patent in view of the U.S. Patent No. 6,235,191 issued to Nakamura. The Examiner stated that the Mahmud patent describes a water purification apparatus comprising a first water purification means (activated carbon bed 23), a second water purification means (filter 24), and a third water purification means (ozone, UV, H₂, O₂ reactor 25), but does not disclose a bypass conduit having a valve or a valve between the inlet end of the bypass conduit and the inlet of the first water purification means or a valve between the outlet of the third water purification means and the outlet of the bypass conduit.

According to the Examiner, the Nakamura patent discloses a water purifying apparatus having an inlet pipe 12, an outlet pipe 22, and a bypass pipe 24 and a valve 24a. The Examiner stated that valves 21a and 23a are provided so that the tap water flows through the bypass pipe 24 without passing through the purification unit 10 and the sterilization unit 20 and so that water is supplied through the outlet pipe 22 in order for raw water to be used while the purification unit 10 or the sterilization unit 20 is being repaired (See Figure 1 and column 2 lines 64-67 and column 5 lines 44-52). In the opinion of the Examiner, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to add the bypass of Nakamura to the water purification apparatus of Mahmud and it would also have been obvious to select an arrangement of valves to isolate the three water purification means.

The Examiner rejected Claims 3, 7, 10, 12, 14, and 19 under 35 U.S.C. § 103(a) as being unpatentable over the Mahmud patent in view of the Nakamura patent, and further in view of the

U.S. Patent No. 5, 585,003 issued to Van Newenhizen. The Examiner admitted that Mahmud and Nakamura do not disclose at least two carbon filters, at least two ultraviolet sources, or a pressure gauge connected to a bypass conduit. The Examiner stated that the Van Newenhizen patent shows a water treatment system with four activated carbon tanks in two parallel series which each include two tanks; ultraviolet lights 44, 98, and 100, with ultraviolet lights 98 and 100 arranged in series; and pressure indicator 112 in the return line and pressure indicator 94 (See Fig. 1, column 3 line 61 to column 4 line 3, and column 4 lines 48-56).

The Examiner rejected Claims 5, 9, 13, 17, 18, and 21 under 35 U.S.C. § 103(a) as being unpatentable over the Mahmud patent in view of the Nakamura patent, and further in view of the U.S. Patent No. 5,972,211 issued to Jones. The Examiner admitted that Mahmud and Nakamura do not disclose at least two particle filters, pressure gages to measure a pressure differential, or control having inputs connected to the pressure gages and outputs connected to the valves. The Examiner stated that Jones shows the use of two U-shaped filtration units 10 in parallel, pressure gages at the inlet and outlet of the filtration units, and automatic control of valves because of a pressure differential across the filters in order to backwash the filters (See column 3 line 55 to column 4 line 67).

Fig. 1 of the Mahmud patent shows a high purity water system of the type used to provide high purity deionized water to points of use in a semiconductor chip manufacturing facility. Clearly, this system would never incorporate a bypass since the sole purpose of the system is to prevent contaminants from reaching the points of use. Therefore, there is no suggestion or motivation for combining Nakamura with Mahmud as suggested by the Examiner.

The Nakamura patent does not show or suggest a pair of valves to isolate the purification unit 10 and the sterilization unit 20 from the water flowing through the bypass pipe 24 as defined by Applicant's claims. Clearly, neither of the units 10 and 20 can be removed for service or replacement while water is flowing through the bypass pipe 24.

The Examiner rejected Claims 8, 15, and 16 under 35 U.S.C. § 103(a) as being unpatentable over the Mahmud patent in view of the Nakamura patent, and further in view of the U.S. Patent No. 5,498,347 issued to Richard. The Examiner admitted that Mahmud and Nakamura do not disclose a water meter connected to the inlet or control of valves in response to a sensed water flow rate. The Examiner stated that Richard shows water treating apparatus

having a counting system 5, which makes it possible to control water flow rate (See column 2 lines 61-67).

Applicant amended Claims 8, 15 and 16 to clarify that the water meter measures the amount of water that has flowed into the apparatus to determine when maintenance should be performed as explained on Page 7 at lines 12-14. If desirable, the control can calculate the flow rate using the amount of water at two different times. The Richard counting system 5 is a flow rate indicating device that is used to control the quantity of ozone being introduced as a function of the flow rate of the fluid being treated. There is no suggestion that the Richard counting system 5 measures the total amount of fluid that has flowed into the system as defined by Applicant's claims.

In view of the amendments to the claims and the above arguments, Applicant believes that the claims of record now define patentable subject matter over the art of record. Accordingly, an early Notice of Allowance is respectfully requested.